National Aeronautics and Space Administration

Human Exploration and Operations at NASA

The Human Exploration and Operations (HEO) Mission Directorate provides the Agency with leadership and management of NASA space operations related to human exploration in and beyond low-Earth orbit. HEO also oversees low-level requirements development, policy, and programmatic oversight. The International Space Station, currently orbiting the Earth with a crew of six, represents the NASA exploration activities in low-Earth orbit.

Exploration activities beyond low Earth orbit include the management of Commercial Space Transportation, Exploration Systems Development, Human Space Flight Capabilities, Advanced Exploration Systems, and Space Life Sciences Research & Applications.

The directorate is similarly responsible for Agency leadership and management of NASA space operations related to Launch Services, Space Transportation, and Space Communications in support of both human and robotic exploration programs.

2015/2016 Directorate Goals

Utilize ISS such that ISS shows the economic benefit of space-based research to commercial and private companies.

Increase public awareness of the marvels associated with ISS, including world-class research/ technology advancements and tangible daily benefits to humanity.

Use the ISS international partnerships and the International Space Exploration Coordination Group to develop a global vision for human exploration.

Continue supporting cargo transportation and establish safe and robust commercial crew transportation to ISS for ISS.

Utilize ISS for: basic research; proving new insights into problems affecting people on the Earth; and understanding and developing the systems and protocols necessary for humans to venture beyond low Earth orbit for extended durations.

Articulate meaningful, exciting and viable missions and uses for SLS and Orion MPCV as part of a capability-driven approach to multi-destination human spaceflight exploration.

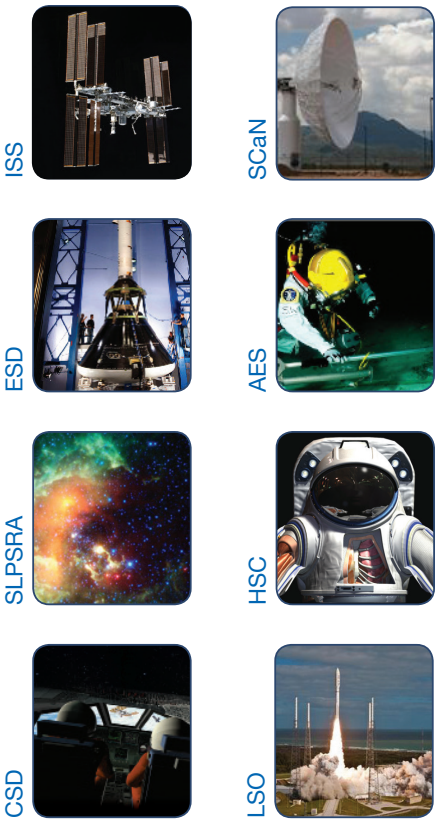
- Engage the public and Congress in understanding the reasons for exploration in a way that is exciting to young people

- Explain the challenges and risks associated with operating at the frontier of research and technology

- Show the potential benefits of accepting the risks inherent in operating at the frontier

Articulate this in a manner so that people can understand why we explore despite the challenges

Grow the effectiveness of the directorate and make it a place where people want to work by continuing to technically develop, challenge, and inspire all ages of our civil servant technical workforce.



2015/2016 Division Goals

INTERNATIONAL SPACE STATION

The International Space Station (ISS), as a unique multinational micro-gravity laboratory, allows for the advancement of scientific knowledge both for the benefit of people living on Earth and for the furthering of human and robotic exploration of destinations beyond low-Earth orbit, including asteroids and Mars.

In 2015 and 2016, the ISS will seek to achieve all research and exploration goals while maintaining a full crew complement.

EXPLORATION SYSTEMS DEVELOPMENT

NASA's Exploration Systems Development is building the Agency's crew vehicle, next generation rocket, and ground systems and operations to enable human exploration to multiple deep space destinations extending beyond our Moon, to Mars and across our solar system.

In 2015 and 2016, ESD will continue to make progress toward the first Exploration Mission (EM-1). This includes leading all three programs through CDR; delivering the EM-1 crew module pressure vessel to KSC for assembly, integration and test; conducting multiple SLS Booster Qualification Motor Tests at Orbital/ATK; and continued development of command and control software for Firing Room 1 to provide support for KSC launch operations.

SPACE LIFE and PHYSICAL SCIENCES RESEARCH and APPLICATIONS

The Space Life and Physical Sciences Research and Applications Division (SLPSRA) is focused on using the ISS for basic research, proving new insights into problems affecting people on the Earth, and understanding and developing the systems and protocols necessary for humans to venture beyond low Earth orbit for extended durations.

In 2015 and 2016, SLPSRA will maintain our commitments to ISS and move forward with the open science concepts with the MaterialsLab and GenesLab initiatives.

COMMERCIAL SPACEFLIGHT DEVELOPMENT

The Commercial Spaceflight Development Division facilitates U.S. private industry development of safe, reliable, and cost-effective human space transportation to and from low-Earth orbit and the International Space Station for use by the U.S. Government and other customers.

The Commercial Spaceflight Development division will continue to support completion of identified milestones by U.S. Industry for the Commercial Crew Transportation Capabilities (CCtCap) contracts, the Commercial Crew Integrated Capabilities (CCiCap) Space Act Agreements, and the Collaborations for Commercial Space Capabilities (CCSC) Space Act Agreements in 2015 and 2016, thereby enabling the eventual purchase by NASA of commercial services and products.

SPACE COMMUNICATIONS and NAVIGATION

The Space Communications and Navigation (SCaN) Program manages all of NASA's communication and navigation capabilities that are required for successful crewed and robotic space missions.

In 2015 and 2016, SCaN will continue critical upgrades to NASA's communication networks, complete TDRS-M spacecraft development, as well as advance NASA's optical communication technology and protect the RF spectrum allocations necessary to communicate with NASA's spacecraft.

ADVANCED EXPLORATION SYSTEMS

The Advanced Exploration Systems Division (AES) leads the agency's deep-space human spaceflight architecture analyses, development of prototype systems, demonstration of key capabilities, coordination international efforts to further space exploration and validation of operational concepts for future deep-space pioneers.

In 2015 and 2016, AES will continue to advance pioneering concepts through cis-lunar and Mars architecture analyses, system prototyping, public-private partnerships, citizen innovator challenges, and work with international partners to refine and update the Global Exploration Roadmap.

HUMAN SPACEFLIGHT CAPABILITITES

The Human Spaceflight Capabilities Division manages flight crew activities, facilities, and rocket test stands and oversees the construction of facilities, knowledge capture, and transfer and environmental compliance and historical preservation.

In 2015 and 2016, Human Spaceflight Capabilities will work to complete required facilities under construction, ensure the health of the 54 crew members that are in training, in flight, or in post-flight recovery, and sustain 90 percent availability of test facilities to support NASA and other customer's planned Test Requirements.

LAUNCH SERVICES

The Launch Services Program (LSP) serves as the Agency's experts for space transportation policy, procuring commercial launch services, certifying commercial launch vehicles, and for providing launch vehicle technical assessments and advisory support to the Cargo Resupply Services and Commercial Crew Programs.

In 2015 and 2016, LSP will pursue safely and successfully launching all assigned missions and the completion of the Falcon 9 v1.1 category 2 certification activities.